

REMARKS***Summary of the Response***

In the present amendment, claims 1, 6, and 8 have been amended for the Examiner's consideration. More specifically, claims 1, 6, and 8 have been amended to recite that the resin layer has a thickness of 1 to 3 μm . Applicants submit that no new matter has been added.

Support for the amendment may be found, for example, at least in original claims 1 and 8, page 6, lines 5 - 13 of the specification, and page 23, lines 1 - 8 of the specification. While acknowledging that the instant specification discusses a thin layer resin primer layer having a thickness of between 1 - 5 μm , Applicants submit that the range of 1 - 5 μm shows Applicants possession and contemplation of the presently claimed range of between 1 - 3 μm . That is, Applicants submit that the disclosure of a thin layer resin primer layer having a thickness of between 1 - 5 μm , shows contemplation of the thin layer resin primer layer having a thickness of, for example, 1 μm , 2 μm , 3 μm , 4 μm , or 5 μm . As such, Applicants submit amending the claims to recite a thickness of between 1 - 3 μm is fully supported by the instant application.

Moreover, Applicants note that the examples discussed in the specification (see, e.g., page 23, lines 1 - 8) discuss a thin layer resin primer layer having a thickness of 1.5 μm , which also lies within the presently claimed range. Applicants respectfully submit that one of ordinary skill in the art reading the instant specification would understand that the disclosure of a thin layer resin primer layer having a thickness of between 1 - 5 μm shows the contemplation by the present inventors of the smaller range of 1 - 3 μm .

Thus, for at least the above reasons, Applicants submit that no new matter has been added by the instant amendment.

Summary of the Office Action

In the instant Office Action, the Examiner has rejected claims 1 - 3, 5, 6, 8 - 11, 13, 14, and 16 - 18 over the art of record. By the present remarks, Applicants submit that the rejections have been overcome, and respectfully request reconsideration of the outstanding Office Action and allowance of the present application.

Priority

Applicants appreciate the Examiner's acknowledgement of receipt of the foreign priority document JP2003-277428. The Examiner asserts that the foreign priority document JP2003-277428 does not provide support for the ultra thin primer resin layer having a thickness of 1 to 5 μm , and thus, asserts that the "instantly claimed invention is not afforded the benefit of the earlier filing date of the foreign application." Further, the Examiner notes that the "foreign application only supports a thickness range of 1 to 3 μm ."

By the present amendment, Applicants have amended the independent claims to recite a thickness range of 1 to 3 μm . Accordingly, Applicants submit that the presently claimed invention should be afforded the benefit of the earlier filing date of the foreign priority document JP2003-277428 of July 22, 2003.

Traversal of Rejection Under 35 U.S.C. § 103(a)

The examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. If the examiner does not produce a *prima facie* case, the applicant is under no obligation to submit evidence of nonobviousness. See MPEP §2142. To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or

motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings.¹ Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

1. Over JP '648 in view of HOSOGANE or KOMIYATANI, and in further view of JP '225 or JP '053

Applicants respectfully traverse the rejection of claims 1 - 3, 5, 6, 8 - 11, 13, 14, and 16 - 18 under 35 U.S.C. § 103(a) as allegedly being unpatentable over JP 2003-229648 [hereinafter "JP '648"] in view of U.S. Patent No. 5,439,986 to Hosogane et al. [hereinafter "HOSOGANE"] or U.S. Patent No. 6,447,915 to Komiyatani et al. [hereinafter "KOMIYATANI"], and further in view of JP 10-190225 [hereinafter "JP '225"] or JP 11-148053 [hereinafter "JP '053"]. Applicants respectfully submit that JP '648 is not prior art against the presently claimed invention. Additionally, Applicants submit that the combination of references do not teach or suggest each of the features of the presently claimed invention.

¹ While the *KSR* court rejected a rigid application of the teaching, suggestion, or motivation ("TSM") test in an obviousness inquiry, the [Supreme] Court acknowledged the importance of identifying "a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does" in an obviousness determination. *Takeda Chemical Industries, Ltd. v. Alphapharm Pty., Ltd.*, 492 F.3d 1350, 1356-1357 (Fed. Cir. 2007) (quoting *KSR International Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1731 (2007)).

Independent Claims 1, 6 and 8JP '648 Is Not Prior Art Against The Presently Claimed Invention

Applicants respectfully submit that JP '648 is not prior art against the presently claimed invention. As noted above, Applicants respectfully submit the presently claimed invention should be afforded the benefit of the JP2003-277428 filing date (i.e., July 22, 2003). Additionally, Applicants note that the publication date of JP'648 is August 15, 2003. As the priority date of the presently claimed invention precedes the publication date of JP '648, Applicants submit that JP '648 is not prior art against the presently claimed invention.

Accordingly, for at least this reason, Applicants respectfully request the rejection of claims 1 - 3, 5, 6, 8 - 11, 13, 14, and 16 - 18 be withdrawn, and claims 1 - 3, 5, 6, 8 - 11, 13, 14, and 16 - 18 indicated as allowable.

Independent Claims 1 and 6

The present invention is directed to a method for manufacturing a copper foil with an ultra thin adhesive layer. Claims 1 and 6 each recite, inter alia:

. . . wherein a resin flow of the ultra-thin primer resin layer when measured in accordance with MIL-P-13949G in the MIL Standard is 5% or less, and for the purpose of the resin flow measurement a thickness of the ultra-thin primer resin layer has been increased to 40 μm .

No Teaching Or Suggestion Of A Resin Flow Of The Ultra-Thin Primer Resin Layer When Measured In Accordance With MIL-P-13949G In The MIL Standard Is 5% Or Less, And For The Purpose Of The Resin Flow Measurement A Thickness Of The Ultra-Thin Primer Resin Layer Has Been Increased To 40 μ m

In addressing this feature of the presently claimed invention, the Examiner acknowledges that none of JP '648, HOSOGANE and KOMIYATANI teach or suggest a resin flow of the ultra-thin primer resin layer when measured in accordance with MIL-P-13949G in the MIL Standard is 5% or less, and for the purpose of the resin flow measurement a thickness of the ultra-thin primer resin layer has been increased to 40 μ m.

However, the Examiner asserts that JP '225 or JP '053 teach these features. Specifically, the Examiner states that:

JP '225 and JP '053 both teach the benefit of having a resin flow within the claimed range for the adhesive layer on a copper foil utilized in producing printed wiring boards (JP'225, Paragraph 0009; JP '053, Paragraphs 0008 -0009) and hence one having ordinary skill in the art at the time of the invention would have been motivated to modify the invention as taught by JP '648 in view of Komiyatani or Hosagane [sic] et al such that the composition and viscosity of the adhesive layer was adjusted to provide a resin flow within the instantly claimed range.

Applicants respectfully disagree.

Applicants submit, however, that neither JP '225 nor JP '053 teaches a resin flow of the ultra-thin primer resin layer when measured in accordance with MIL-P-13949G in the MIL Standard is 5% or less, and for the purpose of the resin flow measurement a thickness of the ultra-thin primer resin layer has been increased to 40 μ m, as recited in claims 1 and 6. JP '225 is directed to the manufacture of a multilayer wiring board. Applicants submit that JP'225, while discussing a *charge of a binder* which is 0.2% to 5.0% of range, does teach or suggest a *resin flow* of the ultra-thin primer resin layer is 5% or less. Moreover, Applicants respectfully submit that JP'225 is silent with respect to the resin flow being measured in accordance with MIL-P-

13949G in the MIL Standard, and for the purpose of the resin flow measurement a thickness of the ultra-thin primer resin layer has been increased to 40 μm , as recited in claims 1 and 6. Thus, Applicants submit that JP '225 fails to teach or suggest a resin flow of the ultra-thin primer resin layer when measured in accordance with MIL-P-13949G in the MIL Standard is 5% or less, and for the purpose of the resin flow measurement a thickness of the ultra-thin primer resin layer has been increased to 40 μm .

Furthermore, Applicants submit that JP '225 fails to teach or suggest a resin layer of 1 to 3 μm , as recited in claims 1, 6 and 8. Applicants note that JP '225 teaches (see Paragraph [0006] of computer-generated translation) a thickness of the dielectric bonding layer to be 20 - 120 μm , and more preferably to be 40 - 70 μm to provide for productivity and/or a particularly desired electrical property.

Accordingly, for at least these reasons, Applicants submit that no reasonable combination of JP '648, HOSOGANE or KOMIYATANI and JP '225 teaches or suggests each of the features of the presently claimed invention.

JP '053 is directed to a heat resistant plastic film laminate and multilayer printed circuit. While JP'053 may teach a resin flow of an adhesive layer is 3.0% to 5.0%, Applicants submit that the resin adhesive layer is not formed on a copper foil, but rather on a *heat-resistant film*. As such, Applicants submit that JP'053 fails to teach or suggest the advantage of having a resin flow within the claimed range for the adhesive layer on a *copper foil*, as the Examiner asserts in her statement of motivation for combining JP '053 with the other cited documents. Accordingly, Applicants submit that one of ordinary skill in the art would not be motivated to combine these documents in the manner asserted.

Furthermore, Applicants submit that JP '053 fails to teach or suggest a resin layer of 1 to 3 μm , as recited in claims 1, 6, and 8. Applicants submit that JP '053 discloses thickness of the adhesive layers (as discussed in the Examples) of 50 μm (see Paragraph [0026] of computer-generated translation), 25 μm (see Paragraph [0028]), and 30 μm (see Paragraph [0030]).

Therefore, for at least these reasons, Applicants submit that no reasonable combination of JP '648, HOSOGANE or KOMIYATANI and JP '053 teaches or suggests each of the features of the presently claimed invention.

Accordingly, for at least these reasons, Applicants respectfully request the rejection of claims 1, 6, and 8 be withdrawn, and claims 1, 6, and 8 be indicated as allowable.

Dependent Claims 2, 3, 5, 9 - 11, 13, 14, and 16 - 18

Claims 2, 3, 5, 9 - 11, 13, 14, and 16 - 18 are allowable at least for the reason that these claims depend from respective allowable base claims, and further because these claims recite additional features that further define the present invention.

Accordingly, for at least these reasons, Applicants respectfully request the rejection of claims 2, 3, 5, 9 - 11, 13, 14, and 16 - 18 be withdrawn, and claims 2, 3, 5, 9 - 11, 13, 14, and 16 - 18 be indicated as allowable.

2. Over POUTASSE II in view of HOSOGANE or KOMIYATANI, and in further view of JP '225 or JP '053

Applicants respectfully traverse the rejection of claims claim 1-3, 5, 6, 8-11, 13, 14, and 16 - 18 under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 5,525,433

to Poutasse (hereinafter "POUTASSE II,") in view of HOSOGANE or KOMIYATANI, and further in view of JP '225 or JP '053.

Independent Claims 1, 6, and 8

The present invention is directed to a method for manufacturing a copper foil with an ultra thin adhesive layer. Claims 1 and 6 each recite, inter alia:

... a ultra thin primer resin layer of a thickness of 1 to 3 μm ...

Additionally, claim 8 recites, inter alia:

... the thickness of the resin layer is 1 to 3 μm .

Not Obvious to Modify POUTASSE II in the Manner Asserted

The Examiner acknowledges that none of the applied documents teaches or suggests a resin layer thickness of 1 to 3 μm . For example, in addressing claims 1, 6, and 8, the Examiner acknowledges that POUTASSE II fails to specifically teach or suggest the recited thickness range. However, the Examiner asserts that it would have been obvious to modify POUTASSE II to arrive at the instantly claimed invention. Applicants disagree.

Applicants respectfully submit that it would not have been obvious to modify POUTASSE II in the manner asserted, as POUTASSE II teaches away from the Examiner-proposed modification. That is, the Examiner-proposed combination would either render POUTASSE II inoperable for its intended use, or change the principle of operation of POUTASSE II. Applicants note that a prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*,

469 U.S. 851 (1984). Applicants note that if a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). Additionally, Applicants note that if the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959).

POUTASSE II is directed to epoxy adhesives and copper foils and copper clad laminates using the epoxy adhesives. POUTASSE II teaches a dry film weight of an epoxy is about 20 to about 50 grams/m². Based on this teaching, the Examiner asserts that:

... it is well established in the art that adhesion layer thickness is a result effective variable affecting the strength between the two surfaces to be adhered and hence one having ordinary skill in the art at the time of the invention would have been motivated to determine the optimum adhesive coating weight or layer thickness for a particular adhesive composition to provide the desired adhesion properties for a particular end use, while conserving material by reducing the thickness as appropriate.

Thus, the Examiner asserts that it would have been obvious to one of ordinary skill in the art to use the epoxy of POUTASSE II (having a dry film weight of about 20 to about 50 grams/m²) to provide a resulting resin layer having a thickness of 1 to 3 μ m, or to use a different epoxy than that taught in POUTASSE II to provide a resulting resin layer having a thickness of 1 to 3 μ m. Applicants respectfully disagree.

Applicants submit that the specific gravity of the ultra thin primer resin layer of the present invention is about 1.2. Thus, the recited thickness of 1 to 3 μ m corresponds to a weight of 1.2 to 3.6 g/m². In contrast, in order for the epoxy of POUTASSE II, which has a dry film weight of about 20 to about 50 grams/m², to form a layer having a thickness of 1 to 3 μ m, the

epoxy would require a specific gravity of about 10, which Applicants respectfully submit is not possible. As such, Applicants submit that it would not have been obvious to modify POUTASSE II as the Examiner asserts, as such a modification would change the principle of operation of POUTASSE II and render POUTASSE II unsuitable for its intended use.

Moreover, Applicants submit that it would not have been obvious to replace the epoxy of POUTASSE II (having a dry film weight of about 20 to about 50 grams/m²) with another material, as that would effectively remove the epoxy of POUTASSE II, which Applicants submit is the essence of the POUTASSE II invention. That is, Applicants submit that such a modification of POUTASSE II would effectively change the principle of operation of POUTASSE II.

As such, for at least these reasons, Applicants submit there is no suggestion or motivation to make the proposed modification and that the teachings of the references are not sufficient to render the present claims *prima facie* obvious.

Independent Claims 1 and 6

Additionally, for the reasons articulated above, Applicants submit that neither JP '225 or JP '053 teaches a resin flow of the ultra-thin primer resin layer when measured in accordance with MIL-P-13949G in the MIL Standard is 5% or less, and for the purpose of the resin flow measurement a thickness of the ultra-thin primer resin layer has been increased to 40 µm, as recited in claims 1 and 6.

Accordingly, for at least these reasons, Applicants submit that no reasonable combination of POUTASSE II, HOSOGANE or KOMIYATANI and JP '225 or JP '053 teaches or suggests each of the features of the presently claimed invention.

Accordingly, for at least these reasons, Applicants respectfully request the rejection of claims 1, 6, and 8 be withdrawn, and claims 1, 6, and 8 be indicated as allowable.

Dependent Claims 2, 3, 5, 6, 8 - 11, 13, 14, and 16 - 18

Claims 2, 3, 5, 6, 8 - 11, 13, 14, and 16 - 18 are allowable at least for the reason that these claims depend from respective allowable base claims, and further because these claims recite additional features that further define the present invention.


Accordingly, for at least these reasons, Applicants respectfully request the rejection of claims 2, 3, 5, 6, 8 - 11, 13, 14, and 16 - 18 be withdrawn, and claims 2, 3, 5, 6, 8 - 11, 13, 14, and 16 - 18 be indicated as allowable.

CONCLUSION

In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw the rejections of record, and allow each of the pending claims. Applicants therefore respectfully request that an early indication of allowance of the application be indicated by the mailing of the Notices of Allowance and Allowability.

If there should be any questions, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully Submitted,
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